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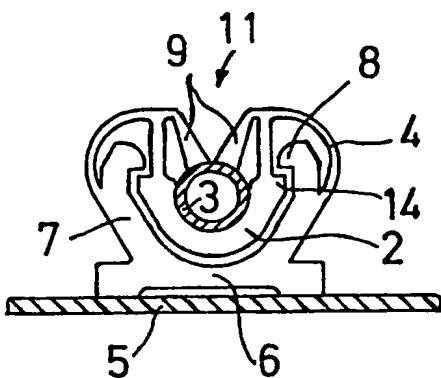
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## (54) Pipe mounting device

(57) A pipe mounting device for vibration-dampingly mounting a pipe, such as a motor vehicle brake pipe, includes a base body (6) of hard, elastic, plastics material, which can be anchored to a carrier plate (5), and a holding shell portion (2) shaped clampingly to embrace a pipe (3) to be mounted. The portion (2) is integrally connected to the base body (6) by flexible springy strip or web portions (4) and is held thereby in its position of use in a freely floating condition, spaced a distance *a* from the base body (6).

In order to protect the web portions (4) from an excessive force acting thereon and at the same time to ensure a secure mounting for the pipe, the holding shell portion (2) is provided with rigid projections or lugs (14) which, in relation to oppositely disposed projections (8) or corresponding recesses on the base body (6), have a spacing in all directions, which is sufficient for free oscillatory movement.

FIG. 3



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FIG. 1

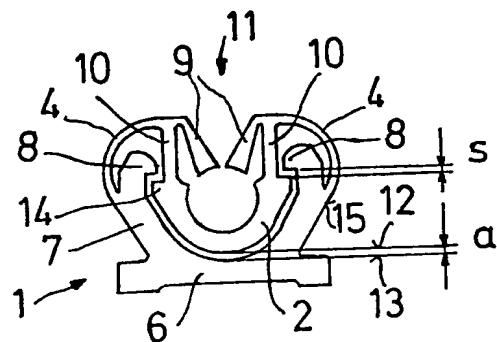


FIG. 2

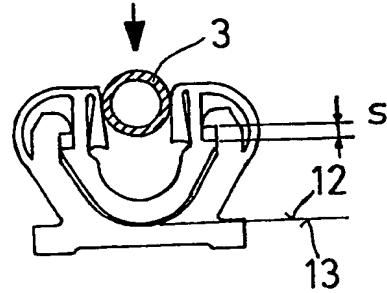


FIG. 3

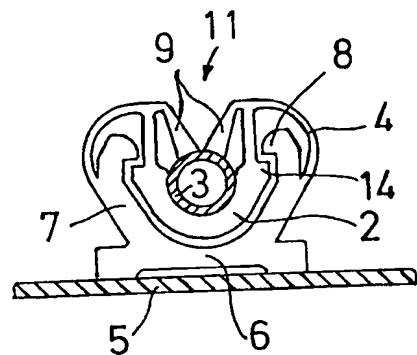


FIG. 4

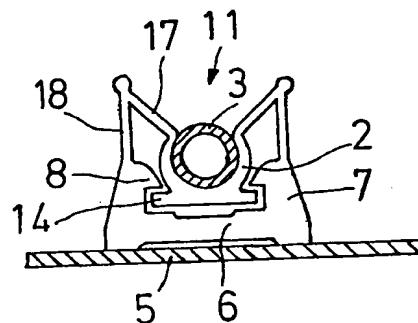
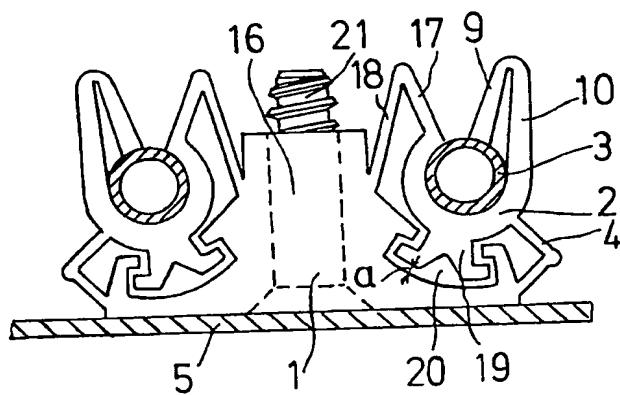


FIG. 5



## SPECIFICATION

## Pipe mounting device

5 This invention relates to a pipe mounting device for mounting a pipe such as a motor vehicle brake pipe in a vibration damped manner. The device includes a base body of hard, elastic, plastics material, which can be anchored to a carrier plate, and holding shell portion shaped clampingly to embrace a pipe to be mounted. The holding shell portion is integrally connected to the base body by flexible strip or web portions and is provided with

10 rigid lugs or projections which co-operate with oppositely disposed projections or recesses on the base body.

In a known device of this kind (US patent specification No. 3 944 177), the base body has two wall portions between which the holding shell portion is fixedly clamped and held by the projections. The flexible strip portions are provided to hold the holding shell portion, above the wall portions, in an upwardly open condition for receiving the pipe. When the pipe is inserted, the end portions of the holding shell portion are brought together and are pressed down between the wall portions until the projections on the holding shell portion fixedly engage beneath and in contact with the corresponding projections on the wall portions. Such a mounting device can easily be fitted and provides a secure mounting for the clamped pipe which is also not loosened by vibration of the motor vehicle.

However, experience has now shown that, when mounting brake pipes, in particular for brakes which are controlled by an anti-lock system, oscillations occur which, when the 40 brake pipe is rigidly mounted, as by the device of US 3944177, are transmitted to the vehicle body and which can then be felt as vibrations of the vehicle body, depending on the natural frequency of the body.

45 There is thus a need for a pipe mounting device with an improved connection between the holding shell portion and the base body such that oscillations or vibrations which occur in use of the anti-lock system are absorbed or

50 at least strongly damped by the device.

According to the present invention, there is provided a pipe mounting device for mounting a pipe such as a motor vehicle brake pipe in a vibration damped manner, which device includes a base body of hard, elastic, plastics material, which can be anchored to a carrier plate, and a holding shell portion shaped clampingly to embrace a pipe to be mounted, which holding shell portion is integrally connected to the base body by flexible strip or web portions and is provided with rigid lugs or projections which co-operate with oppositely disposed projections or recesses on the base body, wherein the holding shell portion is held in its position of use by the

flexible strip or web portions such that an outer wall of the holding shell portion opposite to a wall thereof clampingly engageable with a pipe to be mounted, as well as the

70 projections or lugs of the holding shell portion, are at a spacing "a" in all directions, which spacing is sufficient for free oscillation, from the adjacent inside wall and the projections or recesses of the base body. Thus in

75 the event of unforeseen external forces occurring on the pipe, the holding shell portion is held by the contact surfaces of the projections or recesses, after short elastic flexural yielding of the springy web portions. Therefore the

80 spacings between the contact surfaces of the projections and recesses should be so selected that, when the above-mentioned forces occur, the springy web portions are not loaded beyond the elastic flexural limit. Additionally the size of the springy web portions should be such that they are strong enough particularly in cross section, to hold the brake pipes, and that they are also sufficiently elastic, particularly by being of a suitable length,

90 to damp or absorb the oscillations or vibrations. The last-mentioned requirement is met in a particularly satisfactory manner if, as in a further embodiment of the invention, the springy web portions are each formed by two

95 straight web portions which are joined together at an acute angle.

For a better understanding of the present invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawing, in which:

Figure 1 is a front end view of a pipe mounting device according to a first embodiment of the invention,

105 Figure 2 is a front end view of the device of Fig. 1 when a brake pipe is being inserted therein,

Figure 3 shows the device of Figs. 1 and 2 with the brake pipe inserted and on a carrier plate,

110 Figure 4 is a front end view of an alternative form of device of the invention with modified springy web mounting, and

Figure 5 is a front end view of a device of 115 a preferred embodiment of the invention with a base body for fixing to a screwthreaded bolt or pin.

A pipe mounting device of the invention as shown in Figs. 1 to 3 is a development of the 120 device of US 3944177 for mounting pipes, particularly brake pipes. It comprises a base body 1 which is made from hard-elastic, plastics material and a holding shell portion 2 which shaped clampingly to embrace the pipe

125 3. The shell portion 2 is integrally connected to the base body 1 by flexible springy web or strip portions 4.

In arrangement of Figs. 1 to 3, the base body 1 is made up of a bottom plate portion 130 6 which can be anchored to a carrier plate or

panel 5, and two spaced apart wall portions 7 which are connected thereto in a U-shaped configuration and at the ends of which hook-like projections or noses 8 project inwardly.

5 The bottom plate portion 6 may be connected to the carrier plate 5 in any desired way, such as by screwing, riveting, glueing or in some other fashion.

The holding shell portion 2 is also U-shaped

10 and at its upper opening 11 is covered by support fingers 9 which can be resiliently sprung open and which are formed on extension portions 10 of the holding shell portion 2, at a spacing above the opening 11.

15 When the pipe 3 is pressed into the opening 11 the support fingers 9 are deflected towards the sides (see Fig. 2) and then spring back into their initial position above the pipe 3 as soon as the pipe 3 bears against the shell portion 2 (see Fig. 3).

The outer wall 12 of the shell portion 2, that is the wall opposite to that contacted by the pipe 3, is shaped to conform to the inside wall 13 of the base body 1 and is at the

25 same spacing "a" from the inside wall 13, on all sides. The holding shell portion 2 is further provided with two lateral lugs or projections 14 which, relative to the oppositely disposed hook noses 8, form a gap "S" of the same

30 spacing "a". The flexible web portions 4 are curved round the hook noses 8, from the upper end of the extension portions 10, and are formed or moulded to the outside surface 15 of the wall portions 7.

35 The web portions 4 are of such a dimension in cross-section that, when the pipe 3 is inserted, the web portions 4 hold the holding shell portion 2 in a "floating" condition at a spacing "a" from the inside wall 13, in its

40 position of use. On the other hand, the web portions 4 are of a flexible construction such that the holding shell 2 can oscillate or vibrate freely in all directions, within the spacing "a". It is only in the event of unforeseen external

45 forces occurring that, by co-operation between the hook noses 8 and the projections, the device ensures that the shell 2 is held tightly after only short resilient flexural yielding of the spring web portions 4.

50 As can be seen from Figs. 2, when the pipe 3 is pressed into position, the web portions 4 yield to such a degree that the outside wall 12 of the shell portion 2 can bear against the inside wall surface 13 of the base body 1.

55 When such contact occurs, the spacing "a" between the two surfaces 12 and 13, in the non-loaded condition, ensures that the springy web portions 4 are not loaded beyond the flexural-elastic range. In other words the contact between the surfaces 12 and 13 prevents further deformation of the device.

Fig. 4 shows an alternative form of device of the invention, with wall portions 7 of reduced length, wherein the spring web portions 65 are each formed by two straight web portions

17 and 18 which are joined together at an acute angle while the web portions 17 which are formed or moulded on the holding shell portion 2 also form the lead-in walls for the pipe 3. In this case also, the spacing "a" on all sides between the base body 1 and the holding shell portion 2 ensures that the spring web portions 17 and 18 cannot be overloaded.

70 Fig. 5 shows a further embodiment of the invention with two holding shell portions, wherein, for receiving a screwthreaded pin or bolt 21 which is fixed to the carrier plate 5, the base body 1 has a receiving portion 16 matched to the bolt or pin size. The spring web portions 17 and 18 which are formed or moulded on the receiving portion 16 are of a bent configuration, as in Fig. 4, while the

80 spring web portion 17 serves also as a lead-in wall, above the opening 11, with the support finger 9 forming the other lead-in wall. Formed or moulded to the lower curvature of the holding shell portion 2 is a substantially T-shaped lug portion 19 which engages in a recess 20

85 which is also of T-shape, in the base body 1, with a spacing "a" on all sides.

#### CLAIMS

1. A pipe mounting device for mounting a pipe such as a motor vehicle brake pipe in a vibration damped manner, which device includes a base body of hard, elastic, plastics material, which can be anchored to a carrier plate, and a holding shell portion shaped clampingly to embrace a pipe to be mounted, which holding shell portion is integrally connected to the base body by flexible springy strip or web portions and is provided with rigid lugs or projections which co-operate with oppositely disposed projections or recesses on the base body, wherein the holding shell portion is held in its position of use by the flexible strip or web portions such that an outer wall of the holding shell portion opposite to a wall thereof clampingly engageable with a pipe to be mounted, as well as the projections or lugs of the holding shell portion, are at a spacing "a", in all directions, which spacing is sufficient for free oscillation, from the adjacent inside wall and the projections or recesses of the base body.

2. A device according to Claim 1, wherein the flexible springy web portions are each formed by two straight web portions joined together at an acute angle.

3. A device according to Claim 2, wherein one of the straight web portions of each pair is connected to the end of the holding shell portion remote from the base body and is also formed as a lead-in wall for introduction of a pipe to be mounted into the holding shell portion.

4. A pipe mounting device substantially as hereinbefore described with reference to Figs. 1 to 3, Fig. 4 or Fig. 5 of the accompanying

drawings.

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